

Claims

- [c1] 1. A mass production encapsulation equipment for organic light emitting display devices, comprising:
a panel supply system, to supply an organic light emitting display panel to the mass production encapsulation equipment;
at least one dispensing system, to coat a resin on the panel;
a turning/storage system, to turn the panel and to store the panel after it is coated with the resin;
a cover plate supply system, to supply a cover plate to the mass production encapsulation system, wherein the cover plate can be optionally coated with the resin;
a lamination/ultra-violet radiation system, to laminate the panel and the cover plate after they are aligned, and having a first ultra-violet radiation system to perform a first stage exposure;
a second ultra-violet radiation system, to perform a second stage exposure to cure the resin;
a transporting system, to transport the panel between the panel supply system, at least one dispensing system, the turning/storage system, the lamination/ultra-violet radiation system, second ultra-violet radiation system, and to transport the cover plate between the cover plate supply system, the lamination/ultra-violet radiation system, second ultra-violet radiation system;
and
an atmosphere control system, to control moisture level and oxygen level of the mass production encapsulation equipment.
- [c2] 2. The mass production encapsulation equipment according to claim 1, wherein the panel supply system is also used as a product removal system.
- [c3] 3. The mass production encapsulation equipment according to claim 1, wherein the turning/storage system stores at least one panel at a time to allow at least one dispensing system to dispense on other panels continuously.
- [c4] 4. The mass production encapsulation equipment according to claim 1, wherein the dispensing system comprises at least one syringe.

- [c5] 5. The mass production encapsulation equipment according to claim 5, wherein at least one dispensing system further comprises a laser distance measuring apparatus to measure a working distance between at least one syringe and the panel.
- [c6] 6. The mass production encapsulation equipment according to claim 4, wherein at least one dispensing system further comprises a contact-type distance detector to measure a working distance between at least one syringe and the panel.
- [c7] 7. The mass production encapsulation equipment according to claim 4, wherein at least one syringe is controlled by a program to precisely position for various dispensing patterns.
- [c8] 8. The mass production encapsulation equipment according to claim 1, wherein the transporting equipment comprises a conveyance belt or a mechanical arm.
- [c9] 9. A mass production encapsulation equipment for organic light emitting display devices, comprising:
a cover plate supply system, to supply a cover plate to the mass production encapsulation equipment;
at least one dispensing system, to coat a resin on the panel;
a turning/storage system, to store the cover plate after it is coated with the resin;
a panel supply system, to supply a cover plate to the mass production encapsulation system, wherein the cover plate can be optionally coated with the resin;
a lamination/ultra-violet radiation system, to laminate the panel and the cover plate after they are aligned, and having a first ultra-violet radiation system to perform a first stage exposure;
a second ultra-violet radiation system, to perform a second stage exposure to cure the resin;
a transporting system, to transport the cover plate between the cover plate supply system, at least one dispensing system, the turning/storage system, the lamination/ultra-violet radiation system, and the second ultra-violet radiation

system, and to transport the panel between the panel supply system, the lamination/ultra-violet radiation system, and the second ultra-violet radiation system; and
an atmosphere control system, to control moisture level and oxygen level of the mass production encapsulation equipment.

- [c10] 10. The mass production encapsulation equipment according to claim 9, wherein the panel supply system is also used as a product removal system.
- [c11] 11. The mass production encapsulation equipment according to claim 9, wherein the turning/storage system stores at least one cover plate at a time to allow the at least one dispensing system to dispense other cover plates continuously.
- [c12] 12. The mass production encapsulation equipment according to claim 9, wherein the dispensing system comprises at least one syringe.
- [c13] 13. The mass production encapsulation equipment according to claim 12, wherein at least one dispensing system further comprises a laser distance measuring apparatus to measure a working distance between at least one syringe and the panel.
- [c14] 14. The mass production encapsulation equipment according to claim 12, wherein at least one dispensing system further comprises a contact-type distance detector to measure a working distance between at least one syringe and the panel.
- [c15] 15. The mass production encapsulation equipment according to claim 12, wherein at least one syringe is controlled by a program to precisely position them for various dispensing patterns.
- [c16] 16. The mass production encapsulation equipment according to claim 9, wherein the transporting equipment comprises a conveyance belt or a mechanical arm.
- [c17] 17. A mass production encapsulation method for organic light emitting display devices, comprising:

providing a panel supply system to supply at least a panel into a transporting system;
 transporting the panel into a turning/storage system for turning over via the transporting system;
 alternately transporting the panel into the first dispensing system and the second dispensing system for coating a resin on the panel;
 transporting the panel coated with the resin by the first and the second dispensing systems into the turning/storage system for storage;
 transporting the panel into a lamination/ultra-violet radiation system by the transporting system;
 transporting a cover plate into the lamination/ultra-violet radiation system by the transporting system, wherein the cover plate is optionally also coated with the resin;
 performing lamination of the cover plate and the panel and performing the first stage exposure by an ultra-violet light; and
 transporting the panel laminated with the cover plate to an ultra-violet radiation system to perform the second stage exposure.

- [c18] 18. The mass production encapsulation method according to claim 17, wherein the cover plate is selected from a group consisting of glass, plastic, acrylic, polymer and metal.
- [c19] 19. The mass production encapsulation method according to claim 17, wherein the transporting system comprises a conveyance belt or a mechanical arm.
- [c20] 20. The mass production encapsulation method according to claim 17, wherein the step of coating the resin on the panel using the first and second dispensing systems comprises:
 allocating at least one syringe for each in the first and the second dispensing systems; and
 fixing the panel, and moving the at least one syringe along X, Y and Z directions for coating the resin.
- [c21] 21. The mass production encapsulation method according to claim 17, wherein resin comprises an ultra-violet curing resin or a thermal curing resin.

- [c22] 22. The mass production encapsulation method according to claim 17, wherein the panel and the cover plate are aligned with each other for lamination using a mechanical alignment or a charge-coupled device.
- [c23] 23. The mass production encapsulation method according to claim 17, wherein the step of lamination includes using a mechanical pressure, a gas pressure or a hydraulic pressure.
- [c24] 24. The mass production encapsulation method according to claim 17, wherein the turning/storage system stores at least one panel to allow the first and second dispensing systems to dispense on other panels continuously.
- [c25] 25. A mass production encapsulation method for organic light emitting display devices, comprising:
providing a cover plate supply system to supply at least a cover plate into a transporting system;
alternately transporting the cover plate into a first dispensing system and a second dispensing system for coating a resin thereon;
transporting the cover plate coated with the resin by the first and the second dispensing systems into the turning/storage system for storage;
transporting the cover plate into a lamination/ultra-violet radiation system by the transporting system;
transporting a panel into the lamination/ultra-violet radiation system by the transporting system;
performing lamination of the cover plate and the panel and performing the first stage exposure by an ultra-violet light; and
transporting the panel laminated with the cover plate to an ultra-violet radiation system to perform the second stage exposure.
- [c26] 26. The mass production encapsulation method according to claim 25, wherein the cover plate is selected from a group consisting of glass, plastic, acrylic, polymer and metal.
- [c27] 27. The mass production encapsulation method according to claim 25, wherein the transporting system comprises a conveyance belt or a mechanical arm.

- [c28] 28. The mass production encapsulation method according to claim 25, wherein the step of coating the resin on the cover plate using the first and second dispensing systems comprises:
allocating at least one syringe for each in the first and the second dispensing systems; and
fixing the cover plate, and moving the syringes along X, Y and Z directions for coating the resin.
- [c29] 29. The mass production encapsulation method according to claim 25, wherein resin comprises an ultra-violet curing resin or a thermal curing resin.
- [c30] 30. The mass production encapsulation method according to claim 25, wherein the panel and the cover plate are aligned with each other for lamination using a mechanical alignment or a charge-coupled device.
- [c31] 31. The mass production encapsulation method according to claim 25, wherein the step of lamination includes using a mechanical pressure, a gas pressure or a hydraulic pressure.